Setup and OS update of a napp-it ZFS Storageserver

Setup OS and First steps

Content:

1. OS options for a napp-it ZFS Storageserver

Napp-it is an add-on to build a webmanaged ZFS storageserver appliance on some general use enterprise operating systems. You can select or update them quite independently from napp-it or napp-it updates. Napp-it is transparent with console commands or management that is done with an optional OS-GUI like Mate. This means no vendor lock-in regarding hardware and no lock-in regarding operating systems.

Main platform for napp-it is Oracle Solaris - the origin of ZFS and distributions based on Illumos, the OpenSource fork of Solaris. Most known distributions based on Illumos are NexentaStor, OmniOS, OpenIndiana and SmartOS. Napp-it currently supports OmniOS and OpenIndiana. Both are OpenSource and a free Solaris based alternatives to the commercial closed source Oracle Solaris. Common for all Solaris based options (Solarish) is the unique integration of OS, ZFS, disk management and services, all maintained by the OS supplier itself. The reason why Solaris solutions are often zero config, where services just work with disk detection based on unique WWN numbers and a working fault management/ disk hotspares. OS updates are troublefree and do not brake ZFS.

On a minimalistic Solarish OS like OI/OmniOS, all functions related to ZFS or storage like iSCSI/FC, NFS or SMB are just available and working after initial setup. On a minimalistic Linux OS, nothing is working and for every problem there are several solutions each with its own handling, advantages and disadvantages.

Your napp-it options are:

1.1 Oracle Solaris 11.x (the genuine Solaris)

Oracle Solaris is a commercial OS. You can download Solaris for tests and development from http://www.oracle.com/technetwork/server-storage/solaris11/downloads/index.html. Any commercial use requires a paid subscription that covers support and bugfixes. Development for Oracle Solaris is since 2010 independent from developments of the free Solaris fork and Open-ZFS around Illumos. Oracle Solaris comes with its own ZFS v. 43 implementation that is incompatible with Open-ZFS v5000. (Solaris 11.4)

Main advantage of Oracle Solaris:
- ZFS Encryption as a ZFS property (each encrypted ZFS filesystem can have a different key)
- fastest resilvering on disk failures and scrubbing (https://blogs.oracle.com/roch/entry/sequential_resilvering)
- fastest ZFS server (in my tests faster than the Solaris forks)
- best integration of OS, ZFS v43 and services with Dedup2 deduplication (Solaris 11.4)
- full-featured OS, Oracle maintains OS, ZFS and projects like Crossbow (network), iSCSI/IB/FC, SMB3 and NFS 4.1

Main disadvantage compared to Open-ZFS
- not compatible with Open-ZFS v5000
- not free

1.2 OpenIndiana (Distribution based on the free Solaris fork Illumos)

OpenIndiana is a distribution that is not only based on Illumos but more or less pure Illumos. Additionally to those features that are part of Illumos it follows the idea of the former OpenSolaris with a minimal text-edition for server use and GUI edition with a desktop for local server management with a filebrowser and firefox for local napp-it management. Development of OpenIndiana is done in a rolling way with a snapshot/isos every 6 months and a repository with newest bits where a pkg update gives you the newest development state.

Main advantage
- Just enough OS for a ZFS storage server with iSCSI/FC, NFS and SMB (textedition)
- GUI edition with a desktop (Mate) and apps like mailclient, browser or office apps
- best integration of OS, Open-ZFS v5000 and services
- full-featured OS, Illumos maintains OS, ZFS and projects like Crossbow (network), iSCSI/IB/FC, SMB and NFS

This is the de facto reference distribution of Illumos
There are talks about a collaboration with OmniOS

1.3 OmniOS (Distribution based on the free Solaris fork Illumos)

OmniOS is now a community driven distribution that is based on Illumos. Additionally to those features that are part of Illumos it adds some features like LX zones/ Linux container. This features are from SmartOS, another Illumos distribution but not yet upstreamed to the common Illumos. Main use case for OmniOS are systems with a focus on stability, security and performance. OmniOS is a very minimalistic OS that is mainly reduced to ZFS, network and storage services that are maintained by Illumos like iSCSI/FC, NFS and the ZFS embedded SMB server to provide best stability in production environments. OmniOS has stable/ long term stable editions, each with its own repository. More, see http://www.omniosce.org/ or https://gitter.im/omniosorg/Lobby
Main advantage
- Just enough OS for a ZFS storage server with iSCSI/FC, NFS and SMB
- Linux and Bhyve container, ZFS encryption, trim, removeable/ special vdev, sequential resilver, system checkpoints
- best integration of OS, Open-ZFS v5000 and services like native multithreded kernelbased SMB3
- full-featured OS, Illumos maintains OS, ZFS and projects like Crossbow (network), iSCSI/IB/FC, SMB and NFS
- stable/ long term stable with dedicated repositories
- The commercial support option for OmniOS .

1.4 napp-it on Linux (ZoL, beta – no support)

Napp-it runs on ZFS/ZoL enabled Linux distributions. Functionality of napp-it is reduced to ZFS/Snap management, Job-management and basic share management functions. As ZFS, ZFS update procedures, autostart options, setup with repositories and disk detection options are different between distributions, the napp-it online wget installer setup napp-it but without ZFS or autostart options for napp-it or jobmanagement.

Main advantage
- best hardware support (although a „best use" Linux storageserver is quite identical to BSD or Solaris one)
- best application support for services beside the common iSCSI, NFS and SMB service.
- SAMBA with many sharing options
- Linux knowledge/ marketshare

Main disadvantage compared to Solarish
- complicated ZFS setup and updates procedures
- not the „it just work/ zero config" experience especially with ZFS and disk detection or NFS, SMB and iSCSI/FC
- SAMBA with quite complicated setup, without SMB groups, ZFS snaps as Windows previous versions
  or Windows SID/ Windows ntfs alike ACL permissions that allows a backup/ restore in an AD environment
  without any additional setting as this is part of the OS/ZFS.

Just compare:
If you install any minimal Linux: nothing is working. You must install ZFS and all services.
Now update to a newer release, propably something is broken

Install a minimal Solaris, OmniOS or OI, ZFS: iSCSI, NFS and SMB are working as they are part of OS and ZFS. there. Update to a newer version and everything is working as the OS maintainer (Oracle, Illumos) cares of all.

1.5 Barebone setup vs virtualized NAS/SAN

A napp-it storage appliance can be installed in a barebone setup directly on hardware or virtualised ex under ESXi if you want all features of a Solarish storage appliance paired with full type-1 virtualisation of any guest OS. ESXi can access the ZFS storage appliance via iSCSI or NFS (I recommend NFS).

If you want additional container virtualisation for Linux guests (LX or Docker) you can either use OmniOS with LX zones/container or virtualize a dedicated OS with Docker on ESXi or Docker or Vsphere Integrated Containers.

If you use a Linux system with ZFS and any sort of virtualisation layer, you can either use the Linux version of napp-it for ZFS management or you can use a (virtualised) Solaris storage appliance via iSCSI or NFS that offers a lot more features beside basic ZFS options.

2. Napp-it on OmniOS

OmniOS is a comunity driven project with a stable, a longterm stable and a bloody, see http://www.omniosce.org/
Prefer the latest stable or LTS edition. To support further development consider a patronage when using the OS in
a home/Soho environment or the commercial support option from the OmniOS developpers.

2.1 Installation of OmniOS community edition

If you want to install from CD/DVD, burn the .iso installer to a CD-R/DVD-R and boot
If you want to install from USB stick (min 1GB), use the usb image and the imager from openzfs.hfg-gmuend.de
If you want to install in ESXi, copy the iso file to an ESXi datastore and use a virtual DVD drive with the iso
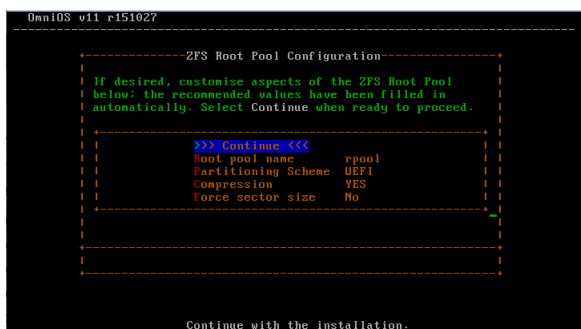
1. Boot from the OS installer r1510xx
2. Install „OmniOS" to disk (use whole disk, boot poolname is rpool) and set network name resolution to DNS
3. Run the online napp-it wget installer wget -O - www.napp-it.org/nappit | perl
4. If you install on ESXi, install vmware tools via pkg install open-vm-tools
5. Set a root and napp-it PW via passwd root (to set a Unix and SMB password) and reboot
6. Connect a browser to http://ip:81 or https://ip:82 for appliance management.
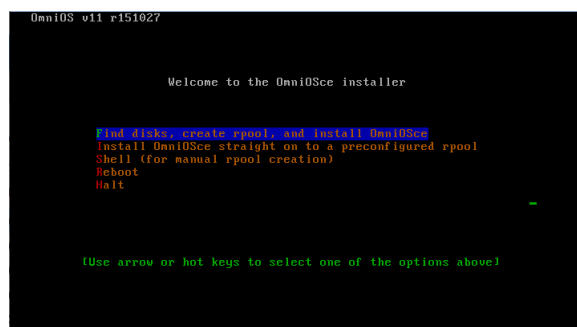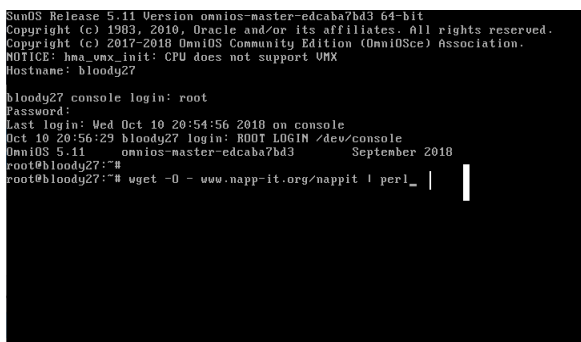
see the following screenshots:

First bootscreen
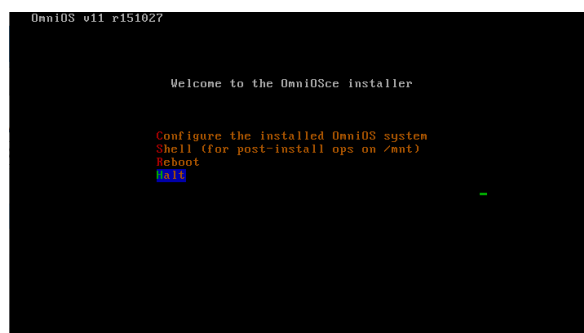Boot installer, then select your keyboard on next screen

Select a bootdisk and edit Boot Pool configurations

You must maintain root pool name = rpool (default)
Prefer the other defaults. In next screens set hostname,
timezone/location. OS language is (and must be) English

Select Configure and „Configure Networking"
Preferred setting: DHCP (auto, requires DHCP server)
other settings: optional, then go back and reboot

Login as root (default: no password)

then setup napp-it via online-installer:
#wget -O - www.napp-it.org/nappit | perl

This starts the online installer

When the napp-it installation has finished, set passwords
for root and napp-it (account napp-it is disabled but pw is required)

passwd root
passwd napp-it

If you have not set network with the installer option, you can set it manually at console
Initial network setup options at console:

- Bootup your system: login as root
- list all physical nics: dladm show-link (ex e1000g0)
- create a logical nics: ipadm create-if e1000g0
- use DHCP for this if: ipadm create-addr -T dhcp e1000g0/dhcp
- add nameserver: echo ‚nameserver 8.8.8.8' >> /etc/resolv.conf -> OS is installed onto
- use DNS: cp /etc/nsswitch.dns /etc/nsswitch.conf

- install napp-it: wget -O - www.napp-it.org/nappit | perl

- set root pw (X,SMB):   passwd root
- set napp-it pw: passwd napp-it (required for sudo)

- reboot and login: use a webbrowser to connect http://ip:81

If napp-it reports a sudo: PAM account management error: Permission denied,
you have forgotten to update napp-it first. To fix this, delete the napp-it entry in /etc/user_attr

Your system is up and ready now, optionally update OmniOS or napp-it to a newer release (see next page)
Keep language settings to us/en or some scripts may not work due to different ZFS date strings
If you use OmniOS-CE commercially, consider commercial support, see https://www.omniosce.org/invoice.html

2.2 Update OmniOS (base OS without zones)

If there is a LTS version in your upgrade path, always upgrade to next LTS first !

Repositories:
https://www.omniosce.org/info/ipsrepos.html

Upgrading:
https://www.omniosce.org/upgrade.html

Update from OmniOS-CE newest stable to bloody (unsupported)
step 1: update to newest stable first, then update, optionally update pkg first via pkg update pkg
pkg update; reboot; (optional)

pkg unset-publisher omnios
pkg set-publisher -P --set-property signature-policy=verify -g https://pkg.omniosce.org/bloody/core omnios
pkg update
reboot

Update from OmniOS-CE bloody to next stable (unsupported)
step 1: update to newest bloody first, then update, optionally update pkg first via pkg update pkg example 031-> 032
pkg update; reboot; (optional)

pkg unset-publisher omnios
pkg set-publisher -P --set-property signature-policy=require-signatures -g https://pkg.omniosce.org/r151032/core omnios
pkg update
reboot

Update from OmniOS-CE 151038/40/42 to 151046 long term stable
(update from 30/32/34/36 -> 38 LTS-> 46 LTS)
https://github.com/omniosorg/omnios-build/blob/r151044/doc/ReleaseNotes.md

update updater then update via pkg update; reboot; (optionally update old system to newest prior an update)

pkg unset-publisher omnios
pkg unset-publisher extra.omnios
pkg set-publisher -g https://pkg.omnios.org/r151046/core omnios
pkg set-publisher -g https://pkg.omnios.org/r151046/extra extra.omnios
pkg update pkg
pkg update
reboot

Update from OmniOS-CE 151030 to 151032/34/36/38 stable (update from 030 -> 032/34/36/38)

https://github.com/omniosorg/omnios-build/blob/r151030/doc/ReleaseNotes.md
https://github.com/omniosorg/omnios-build/blob/r151038/doc/ReleaseNotes.md

update updater then update via pkg update; reboot; (optionally update old system to newest prior an update)

pkg unset-publisher omnios
pkg unset-publisher extra.omnios
pkg set-publisher -g https://pkg.omniosce.org/r151038/core omnios
pkg set-publisher -g https://pkg.omniosce.org/r151038/extra extra.omnios
pkg update pkg
pkg update
reboot

Update from OmniOS-CE 151028 to 151030 LTS (LTS can be updated from any release since last LTS)

https://github.com/omniosorg/omnios-build/blob/r151030/doc/ReleaseNotes.md
Prior an update you must uninstall apps that are no longer available ex gcc48, gcc5 and gcc6 (pkg uninstall gcc48, install gcc7 later)
run a „pkg list | grep gcc | grep -v runtime" and uninstall all gcc related packages for gcc lower gcc7

pkg update; reboot; (optionally update old system to newest)

pkg unset-publisher omnios
pkg set-publisher -g https://pkg.omniosce.org/r151030/core omnios
pkg update
reboot

Update from older OmniOS

I would
save /var/web-gui_my/*
write down users with their uid
reinstall newest OS
restore /var/web-gui_my/* and recreate users

2.3 OmniOS on ESXi

OmniOS is a very stable OS for a virtualized SAS under ESXi. I introduced this idea in 2010 and use this configuration since then in my own production systems. You can do a regular setup on ESXi (use 6.7U3) onto a 30GB virtual disk on a local ESXi datastore. Then install vmware tools via pkg install open-vm-tools. Use a dedicated HBA in pass-through mode to give OmniOS direct disk access with its own HBA driver. Create a ZFS and share it via NFS. You can then use this NFS/ZFS datastore for all other VMs. Please bootup this storage VM as first VM.

2.4 Solaris 11.4 on ESXi

Update to newest Solaris 11.4. At home update to Solaris 11.4 CBE via pkg update (confirm license):

Solaris is the fastest and most feature rich ZFS server. You can use it as a virtual storage appliance under ESXi with the genuine VMware tools from Vmware.
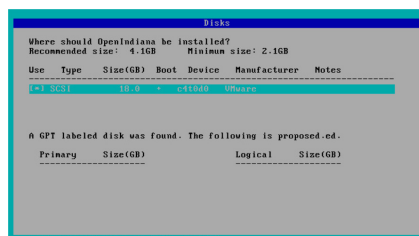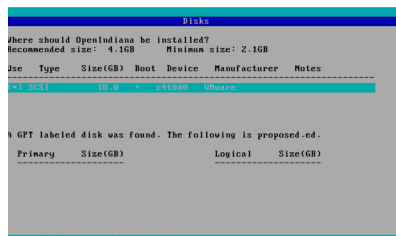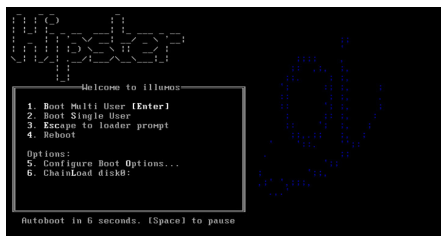
3. Napp-it on OpenIndiana Hipster
http://docs.openindiana.org/handbook/getting-started/

3.1 OpenIndiana minimal text edition (https://www.openindiana.org/download/)
Download OpenIndiana Hipster minimal text edition as an iso or usb installer and boot.
Select keyboard, language, Install OI and bootdisk, automatically network (DHCP), timezone and root pw

after next boot, login as root and install some basic tools that are needed for napp-it via pkg command:

pkg update to optionally update to newest minimal edition, you must reboot then
pkg install sudo
pkg install gnu-coreutils
pkg install unzip
pkg install wget
wget -O - www.napp-it.org/nappit | perl   # reset root pw after napp-it setup to create an SMB PW

optionally
Add ESXi vmware tools: pkg install open-vm-tools
Keep language settings to us/en or some scripts may not work due to different ZFS date strings

3.2 OpenIndiana regular text edition (adds languages and comes with more tools)
This is the default basic install, just install napp-it per wget

## 3.3 OpenIndiana GUI edition/ Live edition with desktop
You can boot the Live edition from USB or ISO with the option to install to disk for troubleshooting
or to install OpenIndiana GUI edition or text edition.

3.4 OpenIndiana (GUI edition) on ESXi 6.7

Download the 2018.04 iso installer from openindiana.org and login to the ESXi webconsole,
click on Storage under Navigator, right mouse-click on a datastore and select Browse. Create a folder named iso
and upload the iso installer to this folder:
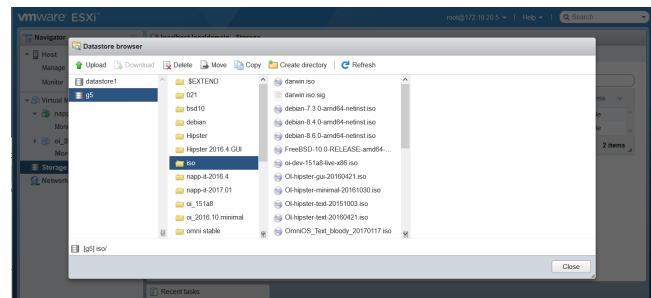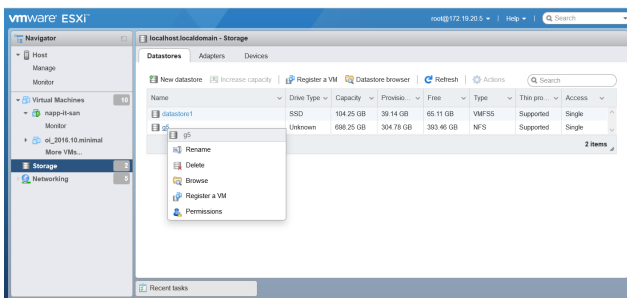
Next create a new VM of guest family „Other" and guet os „Oracle Solaris 11 64bit", select a datastore (best on ZFS)
and customize VM settings. Click on „Add other device", select CD/DVD. Switch CD/DVD setting from Host device
to dastastore Iso file and select the OpenIndiana installer .iso. You can now boot the VM from the Live DVD.
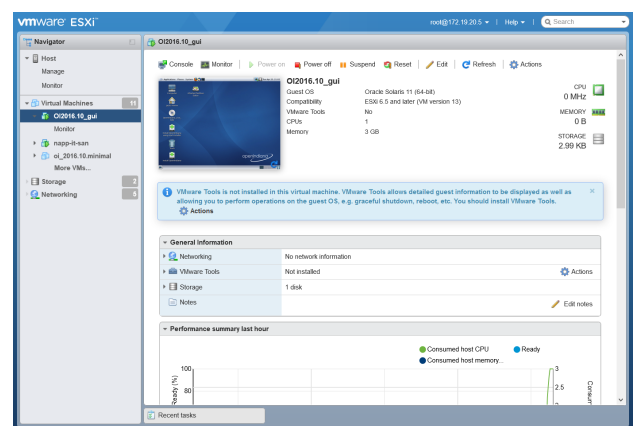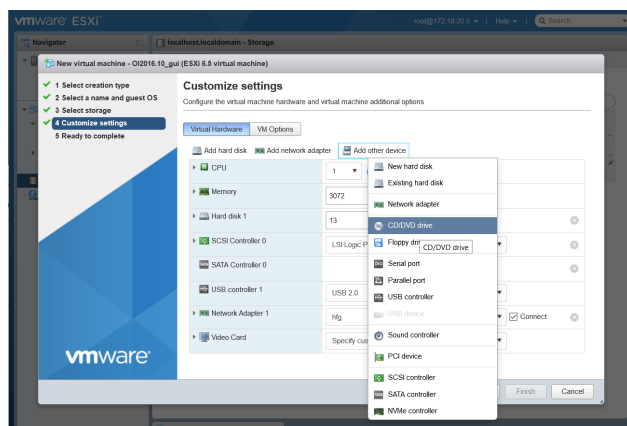
You can click on the monitor preview to enlarge the view. It is suggested to use the optional remote console
Right-click on the console windows and Download VMRC. After downloading select Launch remote console.
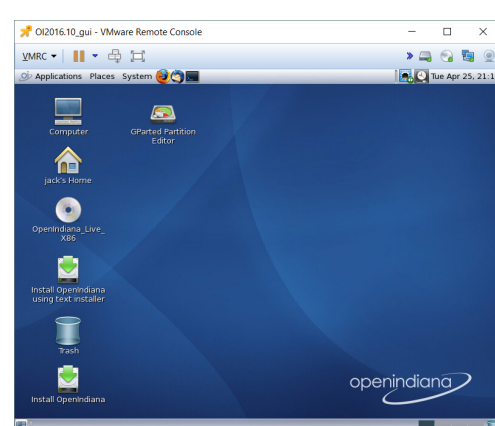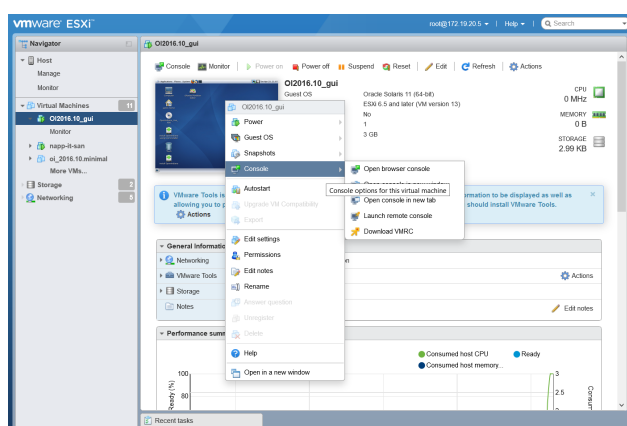
The remote console has a better reactiveness and less problems with special characters than the pure webconsole.

Now click on Install OpenIndiana and install to a virtual ESXi disk (>30 GB) and answer the setup questions.
Without special needs, use the whole virtual disk as systemdisk for OI. During setup add a temporary root
password (must be changed on first use) and create a regular user with a password. Remember them!

To escape the mouse from the ESXi console, press Ctrl + Alt on your keyboard.

3.5. Configure OpenIndiana (GUI edition with Mate desktop)

Install the version with a GUI for local system and file management + Firefox for napp-it management locally
see also https://wiki.openindiana.org/oi/MATE+1.18+Desktop
After booting the live edition from DVD or an USB stick, click on „Install OpenIndiana" and install to a disk (>30 GB)
and answer the setup questions. Without special needs, use the whole disk for OI. During setup add a temporary
root password (must be changed later) and create a regular user with a password. Remember them!

After setup and reboot, the system comes up with a login screen. Login as the regular user from setup.
Open a terminal and enter su for root permissions. Enter root pw. On first use you must change root pw.

On ESXi use v6.5d. You must use the remote console after downloading VMRC (menu console) or mouse is not
working. Install vmware tools via pkg install open-vm-tools (reboot) optionally update packages via pkg update

Install napp-it then via wget -O - www.napp-it.org/nappit | perl
After napp-it is installed run a passwd root to create an SMB password for root, optionally reboot
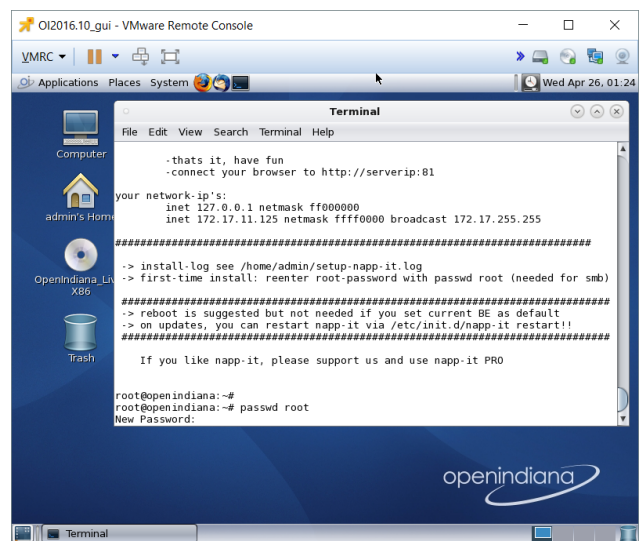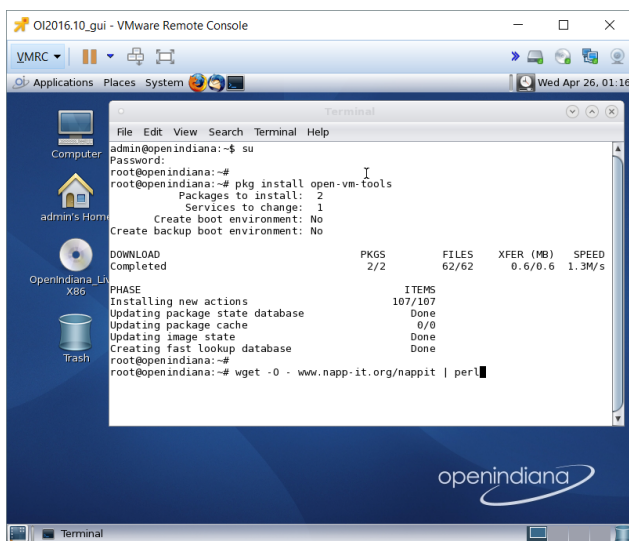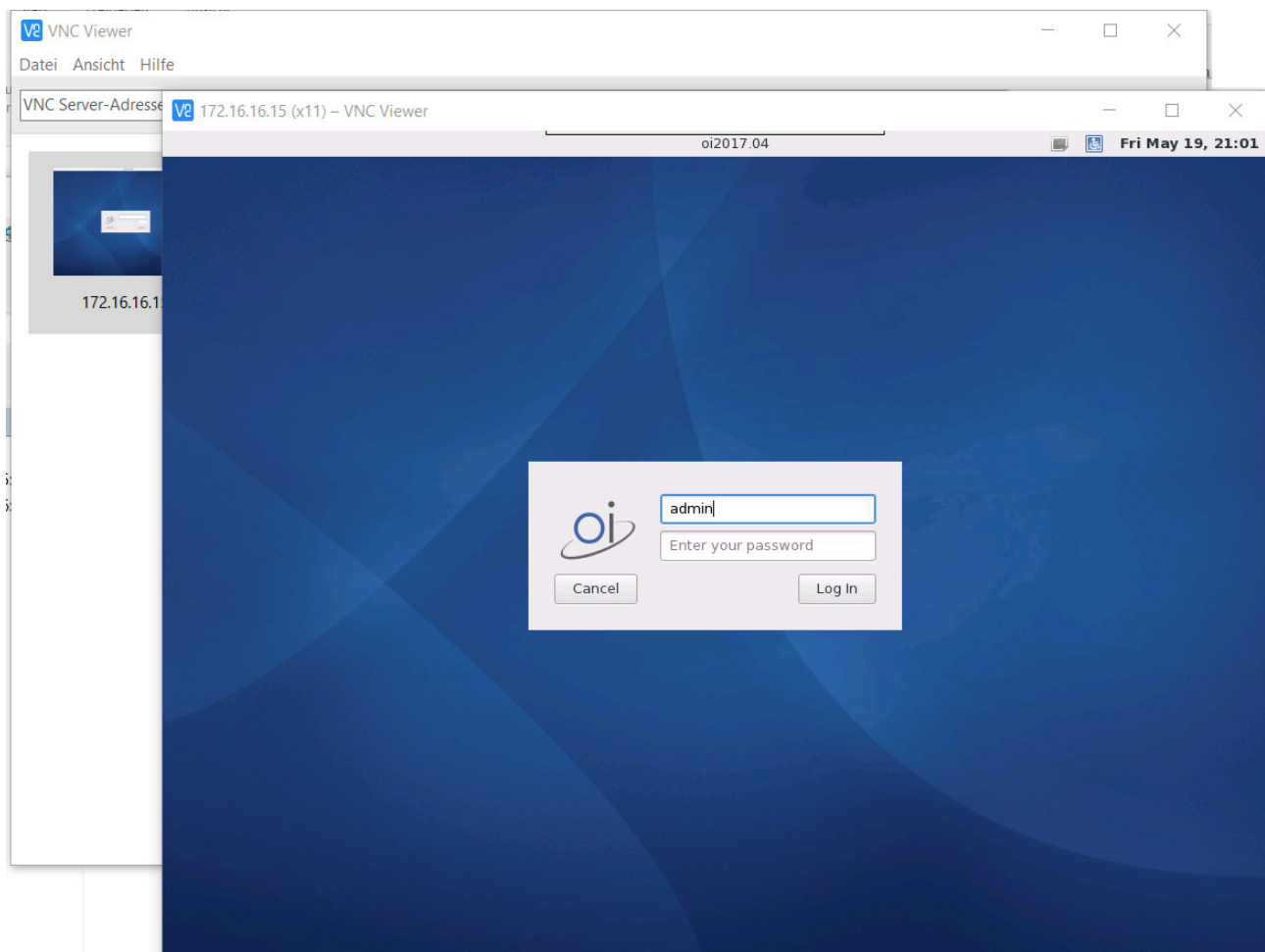

open firefox with URL http://localhost:81
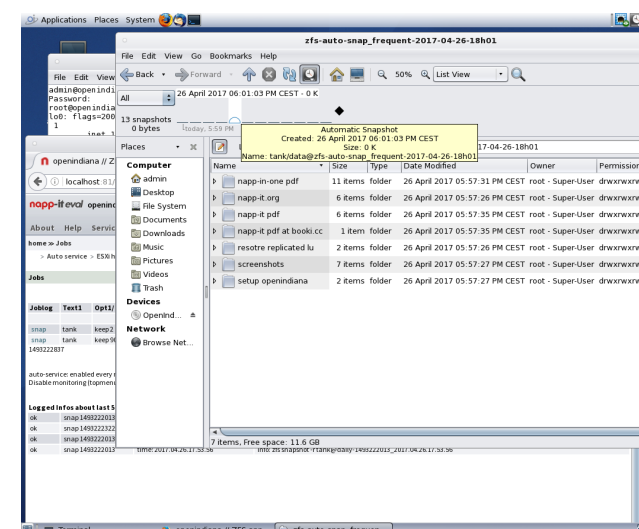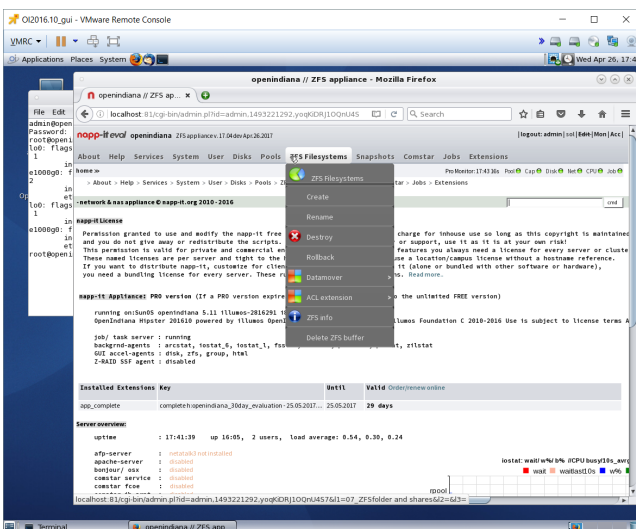
- use menu System > preferences (OI GUI) to increase screen resolution
- use filebrowser to manage files locally
- use Timeslider (filemanager function to browse snaps) to open a folder and go back in time over snaps

Keep language settings to us/en or some scripts may not work due to different ZFS date string

3.5 Remote graphical management via VNC Server/ Mate

- https://wiki.openindiana.org/oi/4.7+Remote+Graphical+Login:+Using+Xvnc+and+gdm+for+One-Shot+sessions

Enable VNC Server and use VNC viewer (OSX, Linux, Windows,..) to connect
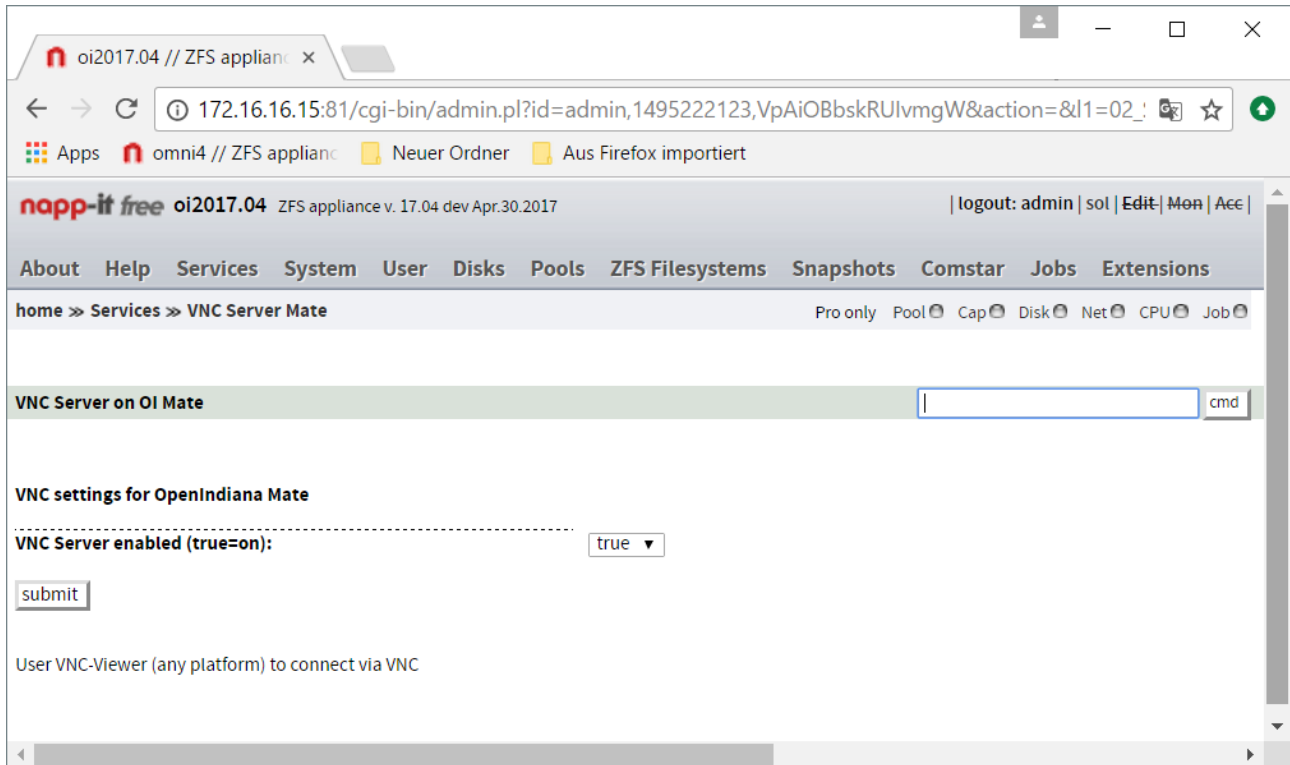
Local + remote management and especially Timeslider are killer features of the GUI version of OpenIndiana

4. Oracle Solaris 11.x (the genuine Solaris)

Oracle Solaris is a commercial OS. You can download Solaris for tests and development from http://www.oracle.com/technetwork/server-storage/solaris11/downloads/index.html. Any commercial use requires a paid subscription that covers support and bugfixes.

4.1 Setup Solaris

Solaris is available as text edition and a GUI edition. This is similar to OpenIndiana.
Setup of Solaris is quite identical to OpenIndiana so follow the steps from there.
Keep language settings to us/en or some scripts may not work due to different ZFS date strings

4.1 Setup Solaris on ESXi

Solaris runs on ESXi. Install Solaris to a 30GB virtual disk an a local datastore. You must then install vmware-tools. You can use the genuine tools from ESXi. For a current ESXi 6.5 you can download the vmtools from vmware.

Up to ESXi 6.0 Solaris tools are included in the boot iso in file \TOOLS.T00\tools-light.tar\6.0\vmtools\ (open in 7zip)
With current ESXi 6.5 vmware tools for Solaris are available from Vmware as a seperate download,
search Solaris tools at vmware

4.2 Setup Solaris 11.4

Solaris 11.4 offers ZFS v43+, NFS 4.1, SMB3, Dedup2, fast sequential resilvering and
encryption as a filesystem property. Solaris is a coomercial enterprise OS. For noncommercial and dev use,
you can use the free Solaris 11.4 CBE (newest 11.4 beta)

Oracle Solaris with the genuine ZFS is the fastest and most feature rich ZFS server.
The new Solaris 11.4 comes with ZFS v.43, dedup2, ultrafast sequential resilvering, ZFS encryption as a filesystem property (different keys per filesystem) and at service level SMB3 and NFS 4.1 and vdev remove incl remove of raid-z vdevs.

Installation details see
http://napp-it.org/downloads/solaris_en.html

napp-it supports Solaris 11.4 up from release 18.12

Solaris 11.4b manuals
https://docs.oracle.com/cd/E37838_01/

5. Napp-it on Linux (beta, no support)

Napp-it on Linux supports ZFS and Snapmanagement, Jobmanagement and basic share management (not the featureset of the Solaris version). As Linux is quite different on every distribution or release regarding ZFS setup, ZFS upgrade, disk identification, service management, package manegement or the installed tools it does not offer the „it just work, zero config" experience. Especially care on OS updates as this can break ZFS.

Napp-it expects that you have a working Linux with ZFS and sudo installed. If sudo is missing example on Debian Install it via apt-get install sudo. You can then run the regular napp-it installer (user root from directory /root): wget -O - www.napp-it.org/nappit | perl

Then you must initially configure sudo, add a napp-it user and create a start command via
sh /var/web-gui/data/tools/linux/napp-it. After this initial command, you can start napp-it via commands napp-it and stop napp-it via command napp-it-stop. napp-it and the job script auto.pl are not started automatically on bootup as the needed commands differ from distributions.

Initial Command overview (user root in /root):
add sudo	apt-get install sudo
download napp-it	wget -O - www.napp-it.org/nappit	perl
initial setup	sh /var/web-gui/data/tools/linux/napp-it

Start/stop of napp-it
start napp-it	napp-it
stop napp-it	napp-it-stop

Autostart
Autostart of napp-it	autostart the script napp-it on bootup
Autostart of the jobs	start (cron every minute): /var/web-gui/data/napp-it/zfsos/_lib/scripts/auto.pl

Disk enumeration
When you have created a pool, you should export/import to pool to use wwn disk enumaration

On problems Linux napp-it may run if you install sudo, unzip, wget, netcat and mini-http manually prior napp-it:

6. napp-it Setup and Update

6.1 napp-it to go

This is a predonfigured ready to run image of OmniOS + napp-it
Images are available as .ova template for ESXi and an Sata image that you can clone to the same SSD.

6.2 manual setup of napp-it (this is the recommeded barebone setup method)

Napp-it can be installed/repaired/updated via an online installer.
Login as root and enter (from root directory):

wget -O - www.napp-it.org/nappit | perl

6.3 Online Update/ downgrade of napp-it

napp-it updates are independently from OS updates. You can update via menu About > update
You can then online update to a newer release or switch to an already downloaded. Last 5 downloads remain available for a update/downgrade. A reboot is not needed. Napp-it creates a backup boot environment prior an update/downgrade. This allows to boot into the former state of the OS.

Update napp-it Free
With napp-it Free you can update/downgrade between free software releases ex 17.01free, 17.06free

Update napp-it Pro
With napp-it Pro you can update/downgrade between all software releases ex 17.01pro, 17.05dev
If you use napp-it Pro you must update to a napp-it Pro software release for all Pro features.

8. Other manuals

All-In-One (virtualised SAN)   http://www.napp-it.org/doc/downloads/napp-in-one.pdf
Build Examples   http://www.napp-it.org/doc/downloads/napp-it_build_examples.pdf
SMB 10G Tunings on OSX/ Windows: http://napp-it.org/doc/downloads/performance_smb2.pdf
Advanced user: http://www.napp-it.org/doc/downloads/advanced_user.pdf

Tuning: http://napp-it.org/manuals/tuning_en.html
more: http://napp-it.org/manuals/index_en.html

LX container on OmniOS 151022:
OmniOS suppports LX branded zones for lightweight virtualisation of Linux VMs

- Oracle Solaris 11.3+ (commercial OS) www.oracle.com/technetwork/server-storage/solaris11/downloads
  manuals   http://www.oracle.com/technetwork/documentation/solaris-11-192991.html

- OpenIndiana Hipster (with a desktop option), community project based on Illumos www.openindiana.org
  Wiki, manuals   https://www.openindiana.org/

- OmniOS (free and stable Solaris fork), community project based on Illumos www.omniosce.org
  Wiki: https://github.com/jfqd/OmniOSce-wiki
  Downloads: https://downloads.omniosce.org/media/ or a mirror like
                       http://openzfs.hfg-gmuend.de
  Community repo is   https://pkg.omniosce.org/r151022/core/en/index.shtml and
  Changelog   https://github.com/omniosorg/omnios-build/blob/r151022/doc/ReleaseNotes.md

OmniOS and OpenIndiana are distributions of the free Solaris fork Illumos.
This fork is based on the last release of OpenSolaris and beside encryption quite identical to Solaris 11 Express

The manuals for Solaris 11 Express can be found under (use download pdf links only)
                       http://archive.is/snZaS

7. Setup napp-it Master Image (napp-it togo VM)

1. Install OmniOS or OI

2. set compress=lz4 rpool

3. set network

       dladm show-link
       ipadm create-if e1000g0   (replace e1000g0 with your link)

       3.1 use DHCP (or skip to 6.0 to use a static adress)
       ipadm create-addr -T dhcp e1000g0/dhcp

       3.2 add nameserver
       echo ‚nameserver 8.8.8.8' >> /etc/resolv.conf

       3.3 use dns (copy over DNS template)
       cp /etc/nsswitch.dns /etc/nsswitch.conf

       If something happens (typo error), retry, opt. delete interface ex ipadm delete-if e1000g0

4 install napp-it
       wget -O - www.napp-it.org/nappit | perl

5. passwd root

6. enable SSH root, login via putty and set basic tuning

7. opt pkg uninstall gcc-51 (32GB)

8. set TLS (encrypted mai)
       pkg install developer/gcc6   (optional, C compiler required, on OI use pkg install developer/gcc-6)
       perl -MCPAN -e shell
           # optionally:
           install CPAN
           reload cpan
       notest install Net::SSLeay
       notest install IO::Socket::SSL
       notest install Net::SMTP::TLS
       exit;

9. disable SSH root

10. set base tuning option

11. delete all BE and create a backup.setup BE

12. run (Sata image only, removes all nic settings)
       perl /var/web-gui/data/tools/other/prepare_image.pl

13. halt

14. clone

AiO ESXi VM (additional steps)

- pkg install open-vm-tools

-create two vnics: e1000 and vmxnet3
 use e1000 for management and vmxnet3 for data, using different ones makes identification easier
 set vnics to default VM network

- edit resolv.conf
domain local
nameserver 8.8.8.8

- set default - tuning

- remove old napp-it releases from /var/web-gui/

- remove /var/web-gui/_log/appliance.log und socketserver.log

- disable SSH root

- reduce BE to:
omnios
omnios.backup

- export OVA template (single file)